

AUG 12 2005

PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	E. Wendell Diller
Application No.:	09/923272
Filed:	August 3, 2001
For:	Elongate Vented Gun Barrel
Examiner:	Michelle R. Clement
Group Art Unit:	3641

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Docket No.: D55.2B-10027-US01**DECLARATION OF E. WENDELL DILLER****PURSUANT TO 37 C.F.R. §132**

My name is E. Wendell Diller. I have been an avid sportsman for 53 years. I have also been manufacturing and testing various types of gun barrels and shotgun shells for about 47 years. I have worked for 31 years in the field of acoustics and acoustic loud speakers. I consider myself to be a person of ordinary skill in the art. I am familiar with the invention disclosed in patent application Serial No. 09/923272.

I have reviewed U.S. Patent # 5,844,162 to Renner ("Renner") and U.S. Patent # 4,546,564 to A'Costa ("A'Costa") as well as the referenced portions of *The Illustrated Book of Guns* ("GUNS").

I have also reviewed the Examiner's assertion that claim 1 is obvious in light of Renner paired with GUNS. Renner teaches dispersion of sound, rather than minimization of sound. "Disperse" is not the same as "reduce"; "disperse" is to "redirect". My invention reduces sound as heard by individuals in the proximity of a firearm discharge. My invention is not related to keeping the same volume of sound and

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merely redirecting the location of the sound as heard by individuals proximate to a firearm discharge. The knowledge of individuals skilled in the art related to venting of a gun barrel is that venting of a gun barrel reduces recoil and barrel rise, but venting does not reduce sound. In fact, the increased noise associated with conventional ported or vented barrels as taught in Renner is well-established in the shooting community as evidenced in the attached articles and gun-hobbyist forum postings (specimens A, B, C, D, E1, E2, F, G, and H). The attached specimens A, B, C, D, E1, E2, F, G and H, are true and correct photocopies of articles and gun hobbyist forum postings.

I have reviewed the A'Costa reference identified by the Patent Examiner. A'Costa is silent regarding noise reduction. A'Costa teaches the engagement of barrel sections together. The Examiner has stated that "it is well known in the art that the longer the barrel the greater the velocity and accuracy". Greater accuracy and velocity is non-analogous to the problem of noise reduction.

An elongated barrel as part of my invention represents the length of time during which the gasses can be released for sound reduction. The longer the barrel, the more time to release the gases which results in less noise. A'Costa lacks any teaching regarding the reduction of noise through porting of an elongated barrel.

Neither Renner, GUNS, and/or A'Costa individually or in combination, teach sound reduction through venting or porting of barrels. Those skilled in the art understand that porting or venting actually increases noise. The understanding to those skilled in the art is contrary to the invention. My invention as described and claimed herein would not be obvious to a person of ordinary skill in the art reviewing the Renner,

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GUNS, and/or A*Costa references individually and/or in combination. My invention as described and claimed herein is not obvious to a person of ordinary skill in the art.

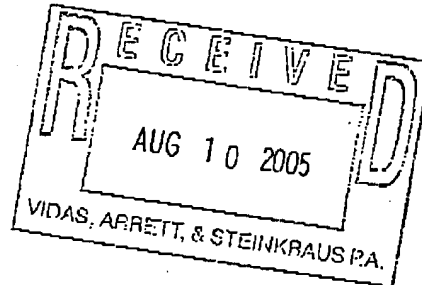
I further declare that all statements made herein of my knowledge are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date: 8-5, 2005

By: E. Wendell Diller
E. Wendell Diller

FAWPWORK\BCB\10027_132declaration_Diller.doc



- Side Saddle
- Knoxx Compstock
- Express' plastic trigger gaurd replaced with a metal one from a police magnum.
- Big Button safety
- Green vang comp follower
- 3 Point Tactical Sling

January 6th, 2004, 10:04 PM

#2

TrapperReady
Senior Member

It looks great! How does it shoot?

Join Date: Jan 2003
Posts: 1,601

I'm interested to know how much blast you see coming up from the ports. I've only got one shotgun with them, but it's got 30" barrels and I run very light target loads through them, so it's not an issue.

Also, have you put enough shells through it to have an opinion on the durability of the light?

BTW, how many decibels does it put out when you shuck it? ☹

January 6th, 2004, 10:57 PM

#3

Blain
Member

Join Date: Jan 2003
Posts: 1,006

Ok, I am going to give you the honest evaluation. The gun shoots great; better than great, actually. Very low recoil, it is easy to control. The sights make it easy to hit with. Shoots both very tight buckshot patterns and slug groups. With the old Estate ammo I got patterns of 4-6" at 30 yards. With my "duty load" of Winchester XX 12 pellet 00 I get patterns of around one foot at 30 yards. I could have picked a round with tighter patterning, but I like the spread, velocity, and pellet distribution that the 12 pellet 00 gives me.

The gun gives very fast velocities, actually, which surprised me since it has such a short barrel, and ported at that. It gives faster velocities than my 20" barreled 870s.

At night, the gun has a very low muzzle signature, actually. The porting actually helps to reduce the light exposure a great deal, which is one of the advertised effects, I was shocked at how well it worked. The down side of the porting is NOISE! Also, the venting upward gasses are hell on the finish of the vent rib, and the area around the porting needs to be scrubbed down because the gasses dirty it up. Not that it effects performance, but I like to keep my gun looking sharp.

The surefire light is very durable and I haven't had many

Outdoor Forums: Backboring and porting

Page 1 of 5

This is topic **Backboring and porting** in forum **Guns and Shooting at Outdoor Forums**.

To visit this topic, use this URL:

http://forums.basspro.com/cgi-bin/ultimatebb.cgi?ubb=get_topic:f=15:t=001696

Posted by **Birdhunter1** (Member # 7308) on 17 May, 2005 02:19 AM :

I kinda know what it is but what does porting a barrel do for the barrel of a shotgun?

What about backboring?

Posted by **GLoomisman** (Member # 4698) on 17 May, 2005 09:03 AM :

Backbored barrels

barrels have a bore diameter increased to near its max spec. This reduces the friction of the shot charge against the barrel wall, resulting in increased shot velocity and reduced recoil. Because there is less constriction and pressure from the forcing cones on a shot charge, there are fewer deformed pellets-this leads to more uniform patterns than with standard barrels.

Porting

Barrel porting works by reduce felt recoil and muzzle jump. These reductions serve to increase shooting comfort and improve follow-up shot speed and accuracy.

Posted by **D Boone** (Member # 5065) on 17 May, 2005 04:42 PM :

Many newer shotguns come with "backbored" barrels as standard...mostly the high end Benellis and Berettas. Porting only really helps with the follow up shot. Since I never miss I don't normally need a second shot and porting my guns would be silly... ☹

Posted by **Birdhunter1** (Member # 7308) on 18 May, 2005 12:56 AM :

I am usually dead on with the first shot too but I am wondering if porting my barrel will help with the third shot on a covey rise of quail. It is not uncommon for me to take two birds on a covey rise with two shots but the third shot for me is harder to come by.

Posted by **DT** (Member # 951) on 18 May, 2005 08:13 AM :

There is a big downside to prtcd barrels. NOISE. Ported barrels are very loud to the shooter and even worse to guys standing next to the shooter. Some of my buddies used to shoot ported barrels in the duck blind. The noise was beyond anything I have ever heard. After two seasons, enough was enough and they sold those guns to get guns with non ported barrels. I have shot both and cannot notice a recoil difference.

Posted by **GLoomisman** (Member # 4698) on 18 May, 2005 09:47 AM :

quote:

Originally posted by DT:

There is a big downside to prtcd barrels. NOISE. Ported barrels are very loud to the shooter and even worse to guys standing next to the shooter. Some of my buddies used to shoot ported barrels in the duck blind. The noise was beyond anything I have ever heard. After two seasons, enough was enough and they sold those guns to get guns with non ported barrels.

Last edited by ribbonstone on 05-15-2005 at 07:02 PM.
Report Post | IP: Logged

Posts: 4,019



05-16-2005, 09:30 PM

Post #7

458plinker

Registered User

Joined: May 2005

Location: SE Kansas

I've very biased to the 45-70, and love the cartridge in any length rifle. I currently have a limited edition 1895CB built for Davidsons (24 Inch barrel, 7 shot magazine, pistol grip, buttplate, half round/half octagonal barrel). It shoots well, handles well, and I like the added firepower. But I also love the guide guns, simply because they are a very powerful package that's easy to pack. I had one of the stainless ported ones, but traded it pretty fast. Didn't care for the porting, and it made no difference to me in recoil or muzzle rise, but was helaciously loud. Got one of the first unported stainless guide guns not long after, and really liked it, but traded it when I went with a custom T/C Encore (HUGE mistake). When finances and frivolity meet up again, I want to get another stainless guide gun 45-70, just because I like them.

458plinker

Report Post | IP: Logged

Posts: 11



05-18-2005, 05:01 AM

Post #8

OldWolf

Registered User



Joined: Feb 2004
Location: North Carolina

I think people dig the looks of short barreled guns.

I like long barrels on rifles and handguns myself.

All IMHO !

Regards,
OldWolf

Report Post | IP: Logged

Posts: 197



05-21-2005, 03:51 PM

Post #9

shootrj2003

Registered User

Joined: Aug 2004

Location: N.Y.

I like mine at 22inches if it had ballard rifling it would be real sweet but I try real hard not to let go of rifles -I get them and keep 'em so i'll have to get another 45-70 Marlin WITH ballard rifling! Besides if I wanted a sawed off .410 I'd buy one. Rifles are supposed to have a barrel long enough to burn all the powder you put in them. IMHO just me. Shootrj2003

Last edited by shootrj2003 on 05-21-2005 at 03:59 PM.
Report Post | IP: Logged

case, but sometimes not enough to get it out of the barrel. Firing another shot can cause the barrel to rupture right in front of your face. Again, if ANYTHING felt wrong, find out why before you shoot again.

A word of caution ... There are two types of ammunition that should probably be avoided most of the time. These are +P and +P+ ammunition. There is nothing wrong with this ammunition, but it is extra power ammo, and in some guns can cause excessive chamber pressures. Every caliber has a maximum chamber pressure, and exceeding it can cause the chamber to rupture. If you feel like you must shoot +P or +P+ ammo, be sure your gun can handle the extra pressure or you might wind up wearing parts of it.

One final word about ammunition ... Cost. In general, the larger a cartridge is the more it is going to cost. .22 ammunition costs a LOT less than 44 Magnum ammo. If you plan on shooting a lot, plan on spending some money. 9mm Luger ammo runs about \$8 to \$10 for a box of 50 (prices vary, of course, and you can get bulk ammo for less), and shooting 100 rounds per trip to the range is very common. Make your practice sessions count. I have seen people at ranges blasting rounds out as fast as they could pull the trigger. On looking at their targets I can only assume they were either trying to see how fast they could move their finger, trying to see how much noise they could make, or trying to impress the uninformed, because they sure as hell didn't hit anything. Try and learn something each time you squeeze the trigger. All you will learn from shooting fast in the beginning stages is that you can mechanically make the trigger move pretty quick, you won't hit very much and you won't learn very much. As your ability to hit the target reliably increases, the speed in which you can do so will automatically increase right along with it.

COMPENSATORS AND PORTING

Compensators and porting both do the same thing. They are basically slots or holes that are cut into the barrel of the gun right at the muzzle. As the bullet passes the ports or comp slots, part of the high-pressure gas exits through the ports or slots and provides a "Jet" effect that compensates for the muzzle flip. The result is that the muzzle does not rise as high and allows the shooter to get back on target quicker.

I do not like porting or compensators except for competition guns. The noise level is increased dramatically, there is a lot of high-pressure, high-temperature gas expelled right in the face of the shooter, and at night your night vision is gone because of the flash that comes out of the ports. In competition, where the rules allow them, comps do provide a distinct advantage but I do not like them for a defensive handgun.

MAINTENANCE

Guns like to be clean, and an occasional cleaning is going to be a requirement. Some guns are easy to disassemble and clean and others are more difficult. Revolvers are usually a lot easier to clean than autoloaders, and also tend to be less prone to problems when they are dirty. Powder residue and dirt build up in the mechanisms can affect the feeding of autoloaders. Most modern guns function just fine when they are dirty, but some really start to get tempermental when they are dirty. A gun that is difficult to disassemble would not prevent me from buying it, but one that doesn't function properly when it is dirty would cause me to move on to the next choice, so this is an item when a friend's opinion is very valuable.

GUN TRIGGER LOCKS AND CHILD SAFETY

It is a parent's responsibility to keep guns out of the hands of their children. Any parent who knowingly allows a firearm to be in a place where a child can play with it is negligent in their duties. It is also the duty of the parents to insure that, as the children get older, they know to stay away from the gun and / or know how to handle it safely. I learned to shoot when I was 9 years old, and there have been guns in my house all my life (nope, they weren't my father's guns, they were my mother's guns; my parents were divorced when I was 3 years old). I was taught at an early age that guns



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Gunfire Sound Levels

Gunfire Noise Level Reference Chart

Below we have listed critical data describing peak sound pressure levels produced by firearms used in shooting and hunting sports. A serious byproduct of this exposure is sensory-neural hearing loss, which cannot be restored to normal. With the introduction of MUZZLE BRAKES and PORTING, the risks of hearing loss dramatically increase. Use this chart as a reference guide for promoting the need of using adequate hearing protection.

Notations

Keep in mind that conversational speech is approximately 60-65 dB, and the threshold of pain is considered to be 140 dB. According to Dr. William Clark, Ph.D. senior research scientist in charge of the NOISE LABORATORY at the Central Institute for the Deaf in St. Louis, the damage caused by one shot from a .357 magnum pistol, which can expose a shooter to 165 dB for 2msec, is equivalent to over 40 hours in a noisy workplace. Dr. Krammer, Ph.D., Ball State University, Muncie, Indiana has documented the following pressure levels.

Table 1. SHOTGUN NOISE DATA (DECIBEL AVERAGES)

.410 Bore 28" barrel	150dB
26" barrel	150.25dB
18 _" barrel	156.30dB
20 Gauge 28" barrel	152.50dB
22" barrel	154.75dB
12 Gauge 28" barrel	151.50dB
26" barrel	156.10dB
18 _" barrel	161.50dB

Dr. Krammer continues to say that shotgun noise averaged slightly more than 150dB. This is approximately 14dB beyond the threshold of pain, and more than sufficient to cause sudden hearing loss with complications.

Table 2. CENTERFIRE RIFLE DATA

.223, 55GR. Commercial load 18 _" barrel	155.5dB
.243 In 22" barrel	155.9dB
.30-30 In 20" barrel	156.0dB
7mm Magnum In 20" barrel	157.5dB
.308 In 24" barrel	156.2dB
.30-06 In 24" barrel	158.5dB

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.30-06 in 18 " barrel	163.2dB
.375 -- 18" barrel with muzzle brake	170 dB

Krammer adds that sound pressure levels for the various pistols and ammunition tested yielded an average mean of 157.5 dB, which is greater than those previously shown for shotgun and rifle noise levels. There was also a greater range, from 152.4dB to 164.5dB, representing 12 dB difference, or more than 10 time as much acoustic energy for the top end of the pistol spectrum. It should be noticed that this figure of 164.5 dB approaches the practical limit of impulse noise measurement capability inherent in most modern sound level meters.

Table 3. CENTERFIRE PISTOL DATA

.25 ACP	155.0 dB
.32 LONG	152.4 dB
.32 ACP	153.5 dB
.380	157.7 dB
9mm	159.8 dB
.38 S&W	153.5 dB
.38 Spl	156.3 dB
.357 Magnum	164.3 dB
.41 Magnum	163.2 dB
.44 Spl	155.9 dB
.45 ACP	157.0 dB
.45 COLT	154.7 dB

The above averages are for all types of ammunition used in these firearms, and should be considered fairly representative. No wonder we hear numerous reports about hearing loss as a result of firearms including acoustic traumas that take hearing completely as a result of one shot. Imagine what the noise levels must be when we incorporate muzzle brakes or porting into firearms, or have a gun explode near the ear due to malfunction.

OUR WARNING IS SIMPLE AND IS IN THE BEST INTERESTS OF EACH SHOOTER. AS THE SOUND PRESSURES INCREASE, SO DOES THE RISK OF PERMANENT HEARING LOSS. IF YOU INCORPORATE A PROCEDURE INTO YOUR SHOOTING THAT INCREASES THE SOUND LEVEL, YOU ALSO INCREASE THE RISK OF HEARING LOSS TO YOURSELF AND POSSIBLY THOSE WHO STAND NEAR YOU. BE SURE TO USE ADEQUATE EAR PROTECTION WHEN USING A FIREARM AND BE CAREFUL OF THOSE NEARBY. LAWSUITS HAVE ALREADY BEEN RECOGNIZED FOR GUNFIRE NOISE THAT HAS RESULTED IN HEARING LOSS. ALWAYS CONSULT A PROFESSIONAL AUDIOLOGIST, OTOLOGIST, OR OTOLARYNGOLOGIST WITH YOUR HEARING PROBLEMS. Hearing loss is not fun and can be prevented.

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E2

6/12/2005

muzzle brakes reduce felt recoil by around 25 percent. This is because most of the gas pushes the bullet from the muzzle through the hole in front of the brake, but these also increase noise and muzzle blast to an unpleasant level.

Muzzle blast is the reason why some manufacturers should cease production on rifles with barrels only 470mm in length, because the further the muzzle extends away from the face, the less bothersome the blast.

I have little enthusiasm for a .30 magnum barrel shorter than 60cm. A .270 or .30/06 can be reduced to 55cm without making a great difference, but the blast becomes annoying once it's cut down to 50cm. Bolt action carbines with 46cm barrels not only show a serious reduction in ballistical performance, but muzzle blast is very troublesome.

The Mag-Na-Port is probably the best way to tame any hard-kicking firearm. This is a patented process which is achieved through an electrical discharge machining (EDM). An electric arc removes metal from barrels without damaging exterior or interior surfaces of the barrel.

Instead of being machined in the normal way, the ports are eroded away by flowing electrons. The machine which does the work generates a very powerful electric spark and when the barrel is flooded with dielectric fluid the spark, switched on and off 200,000 times per second by an electronic circuit, erodes the metal.



Only one of the pair of identical rifles was Mag-Na-Ported, so a comparison could be made of the way they generated recoil and the amount of reduction achieved. (Click graphic for full size view.)

The fluid flushes away the minute metal particles produced and the result is a neat and extremely precise job; no tool marks, no burrs, and no discolouration of the bluing.

Most muzzle-brake devices are bulbous objects threaded on to the muzzle, but Mag-Na-Ports are unobtrusive so most people don't realise your rifle has been Mag-Na-Ported until you point it out.



The Mag-Na-Port system involves cutting four slots in the muzzle of the barrel. There are no attachments to upset barrel and barrel vibrations. (Click graphic for full size view.)

Ports are accurately etched through the barrel into the bore so the propellant gases push the barrel down, negating the effects of muzzle flip and jettling it forward, away from natural recoil forces.

Mag-Na-Port is usually associated with big bore handguns. It has earned an enviable reputation for taming muzzle flip and felt recoil with bruisers such as the .44 Magnum and .45 Winchester Magnum.

Can I order upgraded wood on my gun?

Only the SGr Custom models can be ordered with upgraded wood options.

Can I order a shotgun with extra barrel sets (e.g. 12 ga. and 20 ga. barrels)?

Only our SGr Custom models can be ordered with extra barrels sets. Extra barrel sets are not available for our regular models.

What is the difference between auto-ejectors and extractors?

Auto-ejectors have a spring-loaded device which ejects empty shells about 10 feet in back of you when you open the gun. Extractors merely lift the shells up about 1/2" and you can very easily pluck them out with your fingers. Neither is necessarily better and it is purely a personal choice, but many find it easier not to chase/find/pickup empties and therefore select extractors.

I noticed that some guns have 3" chambers. Can I also use 2-3/4" shells in them?

Yes, both 2-3/4" and 3" shells function perfectly fine in a 3" chamber.

Where is the barrel selector on your single selective trigger models?

The barrel selector on our O/U and SxS are on the safety - shift it left or right to choose which barrel fires first.

What is barrel porting?

Porting is where a series of specially designed small holes are electrically made in the barrels near the muzzle. The barrels are ported for two reasons, both related to recoil: 1) it reduces felt recoil by taking some of the expanding powder gas and "venting" it so it slows/reduces recoil. 2) it reduces "muzzle jump" (where your barrels may jump upward on the shot) so you can recover and get a second shot off quicker. Both issues can be significant factors in your particular shooting. The tradeoffs are that the muzzle blast noise is more noticeable to people standing beside you, and there is a bit of burned powder residue on the barrels and ports that must be cleaned periodically. There is still debate regarding porting, (some love it, some don't) and it comes down to personal preference.

Can you ship guns out of the U.S.?

Unfortunately we cannot export guns to anywhere outside the U.S.

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De Haan Shotguns Ltd.

4660 E 267 N.

Rigby, Idaho 83442

phone: 208-538-6744

<http://www.dhshotguns.com/FAQ.html>

the #4 buck pellets will hit the target with our loads and tubes. The up to 18 simultaneous multiple hits with these big lead #4 buckshot balls deliver a combined effect greater than the sum total of each #4 buckshot pellet's individual energy; and, our 20's can deliver greater energy on a target than does a load of #00 buckshot out of a 12 gauge which misses the target with most of its load's pellets.

Q. I have been using Kent Fast Steel 3" 1 3/8 #3 and been very happy. Kent advertises a 3 1/2" 1 3/8 #3 at 1500 fps. What would you expect the same shot charge to do with an extra 200 fps. Does it give more killing power? I rarely shoot past 40 yards. Would the pattern density change?

A. It's the law (of physics)!!!And, not a simple question. Practical "killing" energy can be increased by (1) increasing the mass of the projectile, by (2) increasing the velocity, or (3) both. Both speeds (1300 fps and 1500 fps) of the same diameter of round steel pellets are going to be going about the same velocity at 60 yards, anyway. There are a lot of variables, but.....in *general*.....Basic rule of thumb: REMEMBER you can't kill 'em if you can't hit 'em. Pattern the 3 1/2" Fast Steel in your gun. If it throws a reliable killing pattern for the size of game you hunt (you don't say swans, cranes, big or little geese or ducks) then use it with confidence, if you want. A #3 steel pellet at 200 fps faster than another #3 steel pellet will definitely hit harder (or carry more potential penetrating-killing energy) within the 40 yards which you specify. However, if the 3 1/2" patterns are poor and spotty for you, I'd definitely stay with the proven effective pattern coverage of the 3" shells over more speed and poorer coverage. If you need more killing power with regular velocity shells, then just go up to #1 or BBs (or larger), *so long as you can cover the target adequately to insure enough hits for a clean kill*. That's one of the biggest advantages of the Wad Wizard®: you can use the BIG stuff and still get great patterns. A load of T's through a Wad Wizard® hitting a big goose is a real eye-opener.

Q. I had a chance to compare the Wad Wizard® against the "PM", so far the Wad Wizard® seems to be patterning better. One thing I noticed about the Wad Wizard® is it does not screw in flush with the top of the barrel. It bottoms out about 1/6 in. before the top. Is this a correct fit?

A. Because these tubes seat on the skirt, not on the shoulder, (to avoid any problems with failure to seat properly) we have designed this tube so that the shoulder may not be flush with the muzzle, insuring a proper seat in all guns. This is because any particular gun may vary.

Q. What are the drawbacks of porting?

A. Some of the more commonly cited drawbacks of porting include greater noise level (especially if you hunt in a blind or in close proximity to other hunters) and increased night flash (this is something that is of concern to police & military personnel). Porting can make the tube much less efficient if you're using high velocity shells. It can also create a higher degree of vibration in the tube and make the tube less sturdy.

Q. What is your recommendations for steel shot for ducks and geese over decoys and pass shooting @ 40 yards or less. (I am not a sky buster.) Also, you certainly must have done some work with "the Supreme " using lead on turkeys at the same distances. I am specifically interested in the shot sizes, types and manufacturer of the shells you found did the best on average for you.

A. First, let me say that you are indeed wise to limit your shots with steel to 40 yards. The "out-to" distance part of your question is the problem here, because that could mean shooting at a bird anywhere from 1 yard away (we have actually encountered this particular problem with customers hunting snow geese in Canada) out to the extreme 40 yards. Also, it is no cop-out to tell you, as I'm sure you already know, that NO two individual gun-choke combos will necessarily "like" the same loads. So, generally, we recommend that you take a little time and pattern your combo with your choice of loads at the ranges at which you'll be shooting to find what works best for you. When you hunt, then we recommend that you range your blind or

<http://www.wadwizard.com/faqs.htm>

6/12/2005

H